AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method for diagnosing doubling in a printing press ~~multistage rotary machine~~ , said printing press ~~rotary machine~~ having one or more stages, each of said stages having one or more rotary components, said method comprising the steps of:

receiving one or more signals from sensors at each of said rotary components;

generating a current error matrix by comparing corresponding ones of said signals from each of said stages; and,

comparing said current error matrix to at least one stored error matrix to identify one of said rotary components having a largest difference between said current and stored error matrices.

2. (Original) The method of claim 1 wherein said stored error matrix is a time-sequence of stored error matrices.

3. (Original) The method of claim 2 and further comprising the step of comparing said current error matrix to a predetermined tolerance.

4. (Original) The method of claim 3 and further comprising the step of, in response to said step of comparing said current error matrix to a predetermined tolerance, updating said stored error matrix with said current error matrix.

5. (Original) The method of claim 1 wherein said signals are digital signals.

6. (Original) The method of claim 5 and further comprising the step of filtering said signals to reduce predetermined frequency components.

7. (Original) The method of claim 6 and further comprising the step of filtering said current error matrix to reduce predetermined frequency components.

8. (Cancelled)

9. (Currently Amended) The method of claim 1 ~~8~~ wherein said stages are printing units.

10. (Original) The method of claim 9 wherein said rotary components include gears and rollers.

11. (Original) The method of claim 10 wherein said current error matrix is a current rotation synchronization error matrix and said stored error matrix is a stored rotation synchronization error matrix.

12. (Original) The method of claim 1 wherein said signals include signals indicative of speed, position, tension, rotary momentum, and acceleration.

13. (Original) The method of claim 1 wherein said sensors include magnetic pickups, proximity probes, accelerometers, tensiometers, and rotary momentum detectors.

14. (New) A method for diagnosing doubling in a multistage rotary machine, said rotary machine having one or more stages, each of said stages having one or more rotary components, said method comprising the steps of:

receiving one or more signals from sensors at each of said rotary components;

generating a current error matrix by comparing corresponding ones of said signals from each of said stages;

comparing said current error matrix to at least one stored error matrix to identify one of said rotary components having a largest difference between said current and stored error matrices;

comparing said current error matrix to a predetermined tolerance; and,

updating said stored error matrix with said current error matrix, wherein said stored error matrix is a time-sequence of stored error matrices.

15. (New) A method for diagnosing doubling in a multistage rotary machine, said rotary machine having one or more stages, each of said stages having one or more rotary components, said method comprising the steps of:

receiving one or more signals from sensors at each of said rotary components;

generating a current error matrix by comparing corresponding ones of said signals from each of said stages; and,

comparing said current error matrix to at least one stored error matrix to identify one of said rotary components having a largest difference between said current and stored error matrices; wherein said signals are at least one of speed, position, tension, rotary momentum, and acceleration signals.

16. (New) A method for diagnosing doubling in a multistage rotary machine, said rotary machine having one or more stages, each of said stages having one or more rotary components, said method comprising the steps of:

receiving one or more signals from sensors at each of said rotary components;

generating a current error matrix by comparing corresponding ones of said signals from each of said stages; and,

comparing said current error matrix to at least one stored error matrix to identify one of said rotary components having a largest difference between said current and stored error matrices; wherein said sensors are at least one of magnetic pickups, proximity probes, accelerometers, tensiometers, and rotary momentum detectors.